CLAIMS

We Claim:

5   1.   A method for selecting an optimal coupling temperature of a nucleic acid synthesis reaction comprising:

   a)   providing:

      i.   a nucleic acid synthesizer comprising a heating component; and

10   ii.   nucleic acid synthesis reagents;

   b)   synthesizing a plurality of nucleic acid molecules with said synthesizer and said nucleic acid synthesis reagents, wherein the synthesis of each nucleic acid molecule of said plurality of nucleic acid molecules comprises a coupling reaction performed at a

15   different temperature within a temperature range; and

   c)   measuring nucleic acid synthesis efficiency for each of said syntheses of said plurality of nucleic acid molecules; and

   d)   selecting an optimal coupling temperature within said temperature range.

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2.   The method of Claim 1, wherein said temperature range is 20 to 60 degrees C.

3.   A nucleic acid synthesizer comprising one or more reaction chambers and

25   a heating component configured to heat said one or more reaction chambers during a synthesis reaction.

4.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a resistance heater.

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5.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a Peltier device.

6.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a heated reagent.

7.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a magnetic induction device.

8.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises microwaves.

9.   The nucleic acid synthesizer of Claim 3, wherein said heating component comprises a transfer of heat from a fluid or a gas.

10.   A nucleic acid synthesizer, comprising:

    a.   one or more reaction chambers containing an oligonucleotide; and

    b.   a heating component,

wherein said heating component is configured to heat said one or more reaction chambers during a synthesis reaction wherein said oligonucleotide is coupled to a synthesis reagent.